CMSC 711 — Computer Networks
Fall 2010

1 General

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Class meets: 11:00 a.m. – 12:15 p.m. Tuesdays and Thursdays, CSIC 3118
Office Hours: 11:00 a.m. – 12:00 p.m. Wednesdays, AVW 4143

Class web site: http://www.cs.umd.edu/class/fall2010/cmsc711

2 Course Summary

This course will cover the principles of wide-area networking with a focus on protocols, implementations, and issues specific to the Internet. We will begin with “classic” Internet protocols, study the basis for scaling Internet-wide services, and investigate a set of advanced topics.

We will emphasize distributed protocols that scale to Internet-wide deployment. We will cover papers in a variety of topics including addressing, user privacy, wireless protocols, peer-to-peer protocols, and network security.

As a part of the course, you will selectively implement new protocols and network services. This course will have a substantial programming component. As part of your final project, you will have to produce a document that resembles a research paper. You will be graded on your execution of the work, as well as your presentation.

3 Expectations: Background

The pre-requisite for this course is full graduate standing and CMSC 417/412, the senior undergraduate-level computer networks and OS courses. As such, I expect you to (a) already understand the basics of computer networks and (b) have experience in implementing non-trivial systems projects. If you have not taken CMSC 417, then, minimally, you should have taken a course that has introduced you to the basics of internetworking: protocol layering and peering; the ISO seven-layer model; rudiments of IP and related protocols such as TCP, UDP, and ICMP; routing protocols and the domain-naming system. You should already know what RFCs and Internet-Drafts are, and have some practice in the art of reading and getting information out of RFCs and Internet-Drafts.

You should already be able to design, implement and test non-trivial (i.e. distributed programs that use the sockets API) programs in C/C++. If you are like me and tend to produce code that has a bug or eight, you should be comfortable with at least one debugger. Experience with multi-threaded code will be helpful for implementing the project. Please note that you are completely responsible for these pre-requisites and they will not be covered in class. This is a graduate course, I expect you to be motivated, eager to learn, and willing to work hard in making up any deficiencies you may have.
The subject matter covered by this course is broad and it will be impossible to lecture on every topic in detail in class. Thus, along with material covered in class, you will be responsible for material not covered in class as well. I expect you to be able to read and assimilate substantial amounts of material outside class. Exams will emphasize material covered in class, but will also include assigned reading (not explicitly covered in class).

Expectations: Postcondition

This is a course that is designed prepare you for systems research in networking. If you are not interested in networking research, you might still want to take this course if you want to get a broad systems background, and understand current research issues in this area. After attending the course, I expect you to be able to:

• Read a research paper in networking and systems and understand the bulk of its content
• Understand the principles behind the Internet protocols
• Understand the limitations of the current Internet and its service model
• Understand the main ideas behind some of the current innovations in networking, including p2p protocols, and network security protocols
• Design, implement, and test substantial parts of network protocols

4 Reading

There is no required textbook for this course. However, I do recommend the following books for reference:


The majority of the class will be taught using papers in the reading list (available off of https://scriptroute.cs.umd.edu/711f10). I will also ask you to look at classic RFCs and current Internet-Drafts. These are available from http://www.rfc-editor.org and http://www.ietf.org respectively.

The reading list on the web is a good approximation of the papers we will cover. However, I expect the reading list to morph during the semester. So, please don’t print out all (any) of the papers right in the beginning unless you intend to read them all.

5 Getting Help

My office hours are 11:00 a.m. – 12:00 p.m. on Wednesdays. You are welcome to come by at other times after making an e-mail appointment. Please remember to put the string CMSC 711: in the subject line of your e-mail.
6 Grading

The grading allocation is given below and is subject to change.

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>Project</td>
<td>35%</td>
</tr>
<tr>
<td>Homeworks, Midterm(s) and Final</td>
<td>50%</td>
</tr>
<tr>
<td>Class Participation</td>
<td>15%</td>
</tr>
</tbody>
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This allocation is subject to change. Any extra credit will only apply to its category, i.e., project extra credits cannot make up for poor exam scores.

Class attendance is not mandatory. You will, however, be responsible for all material covered and assigned in class. The class participation points are to motivate you to speak up in class and to post on the course blog.

7 Policy and Academic Honesty

- Please turn assignments in on time. Unless previously negotiated, you will receive no credit for work that is not turned in on the day and time it is due. The only exception is for excused absences as defined by the university (Section V-1.00(G) of the Consolidated USMH & UMCP Policies and Procedures Manual).

- Do not miss exams. Unless previously negotiated, you will receive zero credit for missed exams. Once again, the only exception is for excused absences as defined by the university.

- Please read and understand the UMCP code on academic integrity (Section III-1.00(A) of the Consolidated USMH & UMCP Policies and Procedures Manual http://www.inform.umd.edu/CampusInfo/Departments/PRES/policies/iii100a.html). Do not violate it. It is not worth your time (or mine) to be here if you do.